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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,735	11/12/2003	Wayne A. Weimer	34003.31	7531

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EXAMINER

ABRAMOWITZ, HOWARD E

ART UNIT PAPER NUMBER

1762

DATE MAILED: 05/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/706,735

Applicant(s)

WEIMER, WAYNE A.

Examiner

Howard E. Abramowitz

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/12/2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 7-15 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/17/04, 6/21/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-6 and 16-20, drawn to group I, classified in class 427, subclass 248.1.
- II. Claims 7-15, drawn to group II, classified in class 356, subclass 301.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process could practiced by a materially different apparatus. The process could be performed in a system without a coated capillary.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Randall Brown on 5/9/05 a provisional election was made without traverse to prosecute the invention of Wayne A. Wlemer, claims 1-6 and 16-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-15 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

Claims 1, 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. (US Patent No. 6,699,724) in view of Armstrong et al. (US Patent No. 6,781,690).

Referring to claims 1 and 16, West et al. discloses tuning an excitation source to an extinction maximum wavelength, tuning the surface characteristics of a substrate to optimize overlap of the surface plasmon resonance wavelength spectrum of the substrate, the excitation bandwidth and the raman scattered wavelengths of the analyte molecule by controlling the deposition parameters associated with deposition of a material on the substrate and fabricating said detection system. (Column 1 lines 54-60, column 3 lines 13-24, column 4 lines 30-37, column 6 lines 40-44, column 8 lines 38-41, column 10 lines 50-55). West et al. does not disclose using fractal microcavities to achieve a SERS enhancement factor of 10^{14} West et al only achieves an enhancement of 600,000 (column 10 lines 50-55). However, Armstrong et al. teaches that using fractal microcavities can result in hotspots that have an enhancement of 10^9 combining this with the enhancement of 600,000 of West et al. leads to an enhancement of $6 \cdot 10^{14}$ (column 2 lines 10-25). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify West et al. to include enclosing the substrate in fractal microcavities as suggested by Armstrong et al. with the expectation of an $\sim 10^{14}$ increase in the signal strength.

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Referring to claim 6, West et al teaches using a silica substrate (column 6 lines 40-45).

Claims 3, 4, 5, 18, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. in view of Armstrong et al. as applied to claims 1, 6 and 16 above, and further in view of Schultz et al. (US Patent No. 6,180,415).

Referring to claims 5 and 20, West et al. in view of Armstrong et al., as discussed above, disclose all of the features of claims 3 and 18 except they do not teach to use thermal evaporation, sputter deposition or chemical vapor deposition as methods for depositing a material on a substrate. However, Schultz et al. teaches that when coating substrates with metal coatings to make plasmon resonant particles that chemical vapor deposition and sputtering are two of a variety of different methods to make the particles and have the ability to control their shape or characteristic (column 5 lines 9-15, column 5 lines 38-41, columns 23-24 lines 62-3, column 24 lines 53-60, column 32-33 lines 66-5). Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify West et al. in view of Armstrong et al. to use sputtering or CVD to create the core shell particles as suggested by Schultz et al. with an expectation that one could control the shape and characteristic of the particles.

Referring to claim 3 and 18, West et al. in view of Armstrong et al. disclose all of the features of claim 3, as discussed above, except controlling the parameters associated with thermal evaporation of metal onto the substrate. However Schultz et al. teaches that sputtering, a method that requires metal evaporation as discussed above is

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an appropriate method for applying the coating onto the substrate. West et al. teaches the importance of being able to control the thickness of the coating because of its influence on the location of the surface plasmon resonance peak (column 8 lines 37-46). Accordingly it would be necessary to control the deposition parameters of the thermal evaporation of the metal in order to control the thickness of the metal layer applied to the substrate. Thus parameters such as time and deposition rate would have to be controlled..

Referring to claims 4 and 19, West et al. discloses that the metal to material can be either gold or silver column 6 lines 40-45).

Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al. in view of Armstrong et al. in view of Schultz et al. as applied to claims 3, 4, 5, 18, 19 and 20 above, and further in view of Bunshah (Deposition Technologies for films and coatings).

Referring to claims 2 and 17, West et al. in view of Armstrong et al. in view of Schultz et al. disclose all of the features of claims 2 and 17 except they do not disclose controlling the temperature of the substrate during deposition of the metal. However, Bunshah teaches the importance of controlling the substrate temperature during sputtering of a pure metal onto a substrate. Bunshah teaches that controlling the substrate can help eliminate inhomogeneities in the coating (page 213). This is desirable since the thickness of the metal coating controls the location of the surface plasmon resonance peak. Accordingly, it would have been obvious to one of ordinary


skill in the art at the time the invention was made to modify West et al. in view of Armstrong et al. in view of Schultz et al. to control the temperature of the substrate as suggested by Bunshah with the expectation that this control will allow for the removal of inhomogeneities.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard E. Abramowitz whose telephone number is 571-272-8557. The examiner can normally be reached on monday-friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on 5712721423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER

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